

REMARKS

Claims 1-3, 6 and 11-13 are pending.

Claims 1-3, 6 and 11-13 are rejected.

35 USC 103 (a)

Claims 1,2,3,6 and 11 and 13 are rejected under 35 USC 103(a) as being unpatentable over Ushirogouchi, US 5,691,101 in view of Titterington, US 6,726,755.

Examiner has used Ushirogouchi as teaching photosensitive resin compositions essentially as claimed except for a green colorant of the formula (1) although Ushirogouchi does suggest the incorporation of phthalocyanines blue.

Titterington teaches phthalocyanines encompassed by present formula (1). See col. 20, formulas (II and III).

Titterington teaches that formulae (II) and (III) may be substituted by R5 to R24 and may be each hydrogen, a halogen or a 1-6C alkyl.

The present compositions are essentially halogen free. However the Titterington formulae may also be halogen free although not specifically taught.

However, there is no direction in Titterington to elect only those specific species of formulae (II) and (III) which are halogen free.

The purpose of Titterington is to formulate phase change inks. In general, phase change inks (sometimes referred to as "hot melt inks") are in the solid phase at ambient temperature, but exist in the liquid phase at the elevated operating temperature of an ink jet printing device. See col. 2, lines 35-40.

The present invention is directed to a photosensitive resin composition. The present photosensitive resin composition is used for solder resist, etching resist or plating resists in the manufacture of printed circuit boards. The present photosensitive resin compositions must have high heat resistance. For example, the presently claimed photosensitive resin composition may be applied as a coating for solder resists and thermally cured at a temperatures of about 150C. Some soldering processes

require that the solder resist be resistant against melt solder temperatures of 260 C. See page 6, paragraphs 3 and 4.

The compositions of Titterington require a phase change at elevated temperatures. The ink compositions must exist as a solid at ambient temperatures and as a liquid phase at elevated operating temperatures. In contrast the present photosensitive resin compositions must remain solid at elevated temperatures and are applied as a liquid. Thus the selection of the phthalocyanines in Titterington and combining with the presently claimed photosensitive resin compositions would destroy the invention on which the Titterington references was based (phase change inks). Furthermore, there is no motivation in Titterington to preferentially select only the species of formula (II) and (III) which are halogen free.

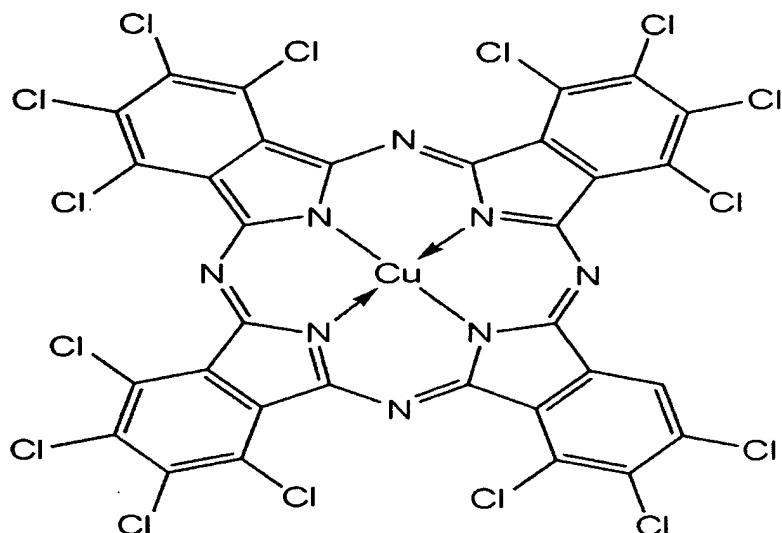
Additionally, the examiner has failed to consider the invention as a whole. The applicants have identified a group of highly heat stable halogen free phthalocyanines for use in photosensitive resins. See examples wherein the coatings are subjected to temperatures as high as 260 C. A need has existed for lower halogen content in resist formulation and the applicants have identified a set of specific halogen free, heat stable phthalocyanines not previously recognized as suitable for use in photosensitive resins. Neither Sasaki nor Homeier recognized the possibility of using the specific phthalocyanines encompassed by claim 1 or 2 in photosensitive resin compositions. Nor did either recognize the heat stability advantages recognized by these specific phthalocyanines. It the applicants who have made and recognized this improvement and are entitled to its protection.

Claims 3 and 12 are rejected under 35 USC 103(a) as being unpatentable over Sasaki, US 4,789,620 in view of Homeier, US 4,039,585.

Examiner believes Sasaki to disclose photosensitive compositions similar to those presently claimed but does teach the phthalocyanine green colorant which has the structure s the formula of instant claim 3. However, Homeier teaches copper tetrahydroxyphthalocyanine dyes used as catalyst in olefin hydroformylating reactions. See col. 5, line 67.

Examiner believes that although Homeier may not specifically teach that the copper tetrahydroxyphthalocyanine is used in a photosensitive composition, phthalocyanine dyes are well known in radiation sensitive compositions. Therefore is would have been obvious to one of ordinary

Sasaki does indeed use phthalocynine dyes in his radiation sensitive compositions. However, Sasaki uses phthalocyanine green, a highly halogenated phthalocyanine. See structure below.



Examiner has plucked the tetrahydroxyphthalocyanine from a very long list of possible phthalocyanines suggested in Homeier. See col. 5, lines 18 through end of column and continued through the top of col. 6. These phthalocyanines are used as catalysts for hydroformulation. There is an absence of any suggestion to use these in photosensitive compositions. Applicants further point out that this is the ONLY compound disclosed in Homeier which meets the limitations of formula (1) defined in either claim 1.

- to pluck from Homeier one particular phthalocyanine from a long list of non-overlapping phthalocyanines
- use the particular phthalocyanine in compositions which have no commonality with the compositions or applications of Homeier
- and further, that this is done with no direction from Sasaki or Homeier other than the fact that Sasaki uses phthalocyanines in his photosensitive compositions.

Applicants respectfully disagree with this analysis.

In a nutshell, the examiner has rejected present claims 3 and 12 because tetrahydroxylphthalocyanine is known and it is known to use phthalocyanine in photosensitive resins. Thus it would be obvious to select tetrahydroxyphthalocyanine.

Obviousness requires more than this. There must be some reason in the prior art or to the art-skilled to actually make the specific combination (tetrahydroxyphthalocyanine in a photosensitive resin composition).

Sasaki suggests only phthalocyanine green for incorporation into his photosensitive resins. See structure above. Clearly there is no overlap here with the tetrahydroxylphthalocyanine and certainly Sasaki give no direction to replace the phthalocyanine green with any other phthalocyanine.

Although Homeier teaches tetrahydroxyphthalocyanine, he teaches it as a catalyst for hydroformulation. This application (hydroformylation catalyst) does not readily come to mind to the art-skilled in photosensitive resins and could hardly be said to be a logical resource for alternative phthalocyanines in photosensitive resins. This is especially so as Sasaki gives no indication he is at all dissatisfied with his phthalocyanine green.

Thus the applicants respectfully submit that the examiner has inadvertently used the applicants' disclosure as the only specific motivation, teaching or suggestion to use the tetrahydroxylphthalocyanine taught in Homeier in the photosensitive resins of Sasaki. This of course is improper.

Furthermore, the examiner has failed to consider the invention as a whole. The applicants have identified a group of highly heat stable halogen free phthalocyanines for use in photosensitive resins. A need has existed for lower halogen content in resist formulation and the applicants have identified a solution not previously recognized. Neither Sasaki nor Homeier recognized the possibility of using the specific phthalocyanines encompassed by claim 3 or 12 in photosensitive resin compositions. Nor did either recognize the heat stability advantages recognized by these specific phthalocyanines. It the applicants who have made and recongized this improvement.

Also, there could be no expectation that the phthalocyanines of Homeier would be successful in the systems of Sasaki. It is reasonable to assume that each system has certain requirements. Sasaki requires a heat stable phthalocyanine compatible with a photosensitive resin. Homeier requires catalytic activity. There is no reason to suppose that simply because a phthalocyanine which works as a good catalyst in Homeier (tetrahydrophthalocyanine) would work as a good colorant in photosensitive resin compositons.


The applicants respectfully request reconsideration and withdrawal of the rejections to claims 1-3, 6 and 11-13 in light of the above remarks.

Since there are no other grounds of objection or rejection, passage of this application to issue with claims 1-3, 6 and 11-13 is earnestly solicited.

Applicants submit that the present application is in condition for allowance. In the event that minor amendments will further prosecution, applicants request that the examiner contact the undersigned representative.

Respectfully submitted,

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